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Attorneys for Defendant Mountain Cement Company

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF WYOMING

Biodiversity Conservation Alliance and Sierra Club,	)	
Plaintiffs,	)	Case No. 04CV 361-B
v.	)	
Mountain Cement Company,	)	
Defendant.	)	

EXPERT WITNESS REPORT OF THOMAS R. KEELER, TRK ENGINEERING SERVICES, INC. ON BEHALF OF THE DEFENDANT MOUNTAIN CEMENT COMPANY

Defendant Mountain Cement Company files the attached expert witness report of Thomas R. Keeler, and pursuant to the Court's Unopposed Motion and Stipulated Order Extending Deadlines in Amended Order On Initial Pretrial Conference.

DATED this 15th day of August, 2005.

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CERTIFICATE OF SERVICE

I, Jason M. Tangeman, certify that a copy of the above and foregoing pleading was served on Plaintiffs by placing a copy of the same in the U.S. Mail, postage prepaid and addressed as follows on August 15th, 2005:

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Jason M. Tangeman

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FOR THE DISTRICT OF WYOMING

Biodiversity Conservation Alliance and Sierra Club,	)	
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v.	)	
Mountain Cement Company,	)	
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EXPERT WITNESS REPORT OF THOMAS R. KEELER, TRK ENGINEERING SERVICES, INC.

A. Summary of Opinions

1. Mountain Cement company has two kiln systems in operation at their Laramie WY Facility. Kiln #1 is a Long Dry Kiln that utilizes a Baghouse and Kiln #2 is a Preheater Kiln system that uses Preheater Cyclones integrated with a Raw Mill and Cooling Tower. The two Kiln systems are very different. Kiln #1 is a much simpler design that operates at a constant high temperature. The Kiln #1 system therefore should have less malfunction of the equipment and less start-up and shutdown period of the related equipment. Because of the simplicity of Kiln #1 it is my opinion that a Baghouse or an Electrostatic Precipitator that was designed properly would tend to have less excess opacity periods than similar equipment on the Kiln #2 system. Kiln #2 system is more complex because it has been designed to provide the feed material for both Kiln #1 and Kiln #2. This function alone makes Kiln #2 more complex and more likely to have startups, shutdowns and malfunction of the system's equipment. Because of theses difference and the complexity of the Kiln #2 system, the use of a baghouse on the Kiln #2 system would not have the same beneficial results as when the ESP was replaced with a baghouse on Kiln # 1 system.

2. The majority of the opacity exceedances documented over the review period were attributed to Startups, Shutdowns and/or Malfunctions (SSM) of process equipment. I reviewed the National Emissions Standards in the Wyoming Air Quality Standards and Regulations, and am familiar with the definitions of "startup", "shutdown", and "malfunction" in WASRQ Chapter 5, Sections 2 and 3. Malfunctions are defined by the State of Wyoming and the federal government as any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process

equipment, or a process to operate in a normal or usual manner. All of the malfunctions listed on the MCC quarterly reports would be considered infrequent and none of the unknown malfunctions contributed to more than 0.08% of the total excess opacities (see attachment #1). Additionally, there was no repetitive contribution of any of the malfunction causes from quarter to quarter.

3. I prepared as Attachment #1 a table of excess opacity using data from the quarterly reports that MCC submitted to the Wyoming Department of Environmental Quality covering periods from December 23, 1999 through the fourth quarter of 2004 (the review period). Of the 1,300.3 hours of excess opacity during the review period, it is my opinion that 97.5 percent of the excess opacity periods, or 1,268.3 hours (or 12,683 six-minute periods) are identified as being caused by startup, shutdown, malfunction or other excused causes. The 2.5 percent of excess opacity periods for Kiln #2 that are identified as unknown causes represent only 32.0 hours (or 320-six-minute periods) of excess opacity from December 23, 1999 through fourth quarter 2004.

4. I have reviewed the chart of excess opacity at MCC that is identified as Exhibit J to Plaintiffs' Motion for Partial Summary Judgment to Establish Defendant's Liability for Opacity Violations. Exhibit J reports there were 15, 480 six-minute periods of excess opacity from Kiln 2. That total is inaccurate because Exhibit J has calculation errors in three quarters, the 4th quarter of 1999, 1st quarter of 2000, and the 4th quarter of 2000. Therefore, the correct number of six-minute periods of excess opacity from December 23, 1999, 5 years before the lawsuit was filed, through December 31, 2004 is 13,003, not 15,480.

5. I have reviewed the tables labeled as Kiln #2 Particulate Matter Violations identified as Exhibit P to Plaintiffs' Motion for Partial Summary Judgment to Establish Defendant's Liability for Opacity Violations. Exhibit P reports there were 800.6 hourly periods where Mountain Cement excess opacity was greater than 20%. That total is inaccurate because Exhibit P includes all excess opacity in the 4th quarter of 1999, not just those from December 23-31 of 1999, 5 years before the lawsuit was filed, and all excess opacity in the 1st quarter of 2005 after Plaintiffs filed their suit. Therefore, the correct number of hourly periods of excess opacity greater than 20% from December 23, 1999 through December 31, 2004 is 579.2 hours, not 800.6 (see attachment #4). Of the 579.2 hourly periods where opacity was greater than 20% only 4.9 hours were identified on the quarterly reports as unknown causes. The other 574.3 hours (99.2% of the total hourly periods) are identified as being caused by events defined as startup, shutdown, malfunction or other excused causes.

6. Based on the information reviewed, my experience and expertise with this ESP, and ESPs at other similar plants, in my opinion MCC has been operating the ESP and Kiln System correctly and performing the proper maintenance to the ESP and Kiln System. The identified causes of the excess opacity that occurred are normal to Kiln operation and startups, shutdowns, and/or malfunctions of the Kiln #2 system equipment.

7. The Kiln #2 ESP is sized sufficiently to maintain the stack opacity within compliance as defined by both the Wyoming and Federal regulations. The opacity trending and quarterly reports show that the ESP has been able to maintain opacity far below the 6 minute 20% opacity limit under normal operating conditions. The majority of the time during start-ups, shutdowns and malfunctions the opacity is below the 6 minute 20% opacity limit. Only under extreme conditions during startups, shutdowns and/or malfunctions has the opacity exceeded the 6 minute 20% opacity limits. It is important to recognize that start-ups, shutdowns and malfunctions of the kiln, rollermill and other equipment can typically last from 15 minutes to over 24 hours, and in that total time period of the start-up, shutdown and malfunction condition the opacity may never exceed or may partially exceed the 6 minute 20% opacity limit. In an effort to reduce the overall opacity levels under normal operating conditions, and further during start-up, shutdown and malfunction periods, the plant has been upgrading the ESP. This is in addition to the use of the more detailed categorized quarterly reports used to help them identify problems with the process and equipment more quickly. These upgrades and better reporting have resulted in a steady decrease of opacity exceedances and in 2004 the total time the opacity was in excess of the 6 minute 20% limit was for 1.75% of the total operating hours.

8. Based on my experience, using an ESP would be the better choice considering the conditions at the plant and the complexity of the Kiln #2 system. Because of the location of the plant (elevation above sea level) more than normal air flow for this type of Kiln #2 system is needed to provide enough oxygen for combustion in the kiln. This requires more process gas than usual to be bypassed around the roller mill, which creates conditions during start-ups, shutdowns and malfunctions that make the ESP the best choice as the pollution control equipment. It is safe to say that replacing the existing ESP with any type of new pollution control equipment should improve performance over the existing ESP, however, there is no clear cut advantage to using a baghouse in this application and especially at this plant location. In fact there are ESPs installed on this type of cement kiln system (preheater kiln system) that have outperformed baghouses. Considering the large swings in moisture and temperature that are required to operate the plant at the high elevation, a baghouse could actually operate poorer than an ESP as a result of damage to the bags from excessive heat or blinding of the bags from excess moisture levels that occur during normal shutdowns, startups and malfunctions.

9. If regulations change in the future and the existing ESP needs to be replaced with a new ESP or a new baghouse, it has been my experience that the most cost effective way to replace the ESP is to build the new equipment adjacent to the existing equipment. There is sufficient land to construct a new ESP or a new baghouse at the Wyoming facility. This method of construction allows the equipment to be built at minimum cost and tied in to the process over a 2 to 3 day outage or during an annual outage.

B. Qualifications of the Expert

1. I have specific expertise in the operation and maintenance of electrostatic precipitators (ESPs). I am currently President of TRK Engineering Services Inc., a consulting service group specializing in ESPs and their application in numerous industrial settings. I am also manager of, and a lecturer with, Precipitator Seminars, which has been conducting seminars on the operation and maintenance of electrostatic precipitators for the past 15 years. I am an electrical engineer with over 25 years experience in the particulate removal field, including 5 years as a field service engineer for Environmental Elements Corporation, an original equipment suppler of ESPs. I have been a speaker at the 1994 & 1998 World Mining Exposition in Chile. I have been a panelist at several of the ESP/FF (Fabric Filter) Round Table Forums.

2. I am the editor and one of the authors of the new EPRI (Electric Power Research Institute) "ESP Maintenance Guide" completed in February 2003. This manual will set the standards for ESP maintenance for many years to come. In 2003 and 2004 I conducted a series of web-based ESP maintenance seminars for EPRI, the first of its kind.

3. I earned my Bachelors of Science Degree in Electrical Engineering from Lehigh University in 1979.

4. I have personal knowledge of the ESP that controls emissions from Kiln #2 at the Mountain Cement Company (MCC) plant in Laramie, Wyoming. The first time TRK Engineering worked at the plant was December 16 –22, 1999 where we helped the plant during an unscheduled shutdown. Beginning in March 2000 and continuing through 2005, my company, TRK Engineering, performed annual inspections and maintenance on the ESP for Kiln #2 during the outages. I have visited MCC's plant on five occasions during annual outages and for on-line inspections and tuning of the ESP controls while Kiln #2 is operating.

5. Pursuant to my retention in the present matter, Mountain Cement Corporation (MCC) agreed to compensate me at the rate of $290.00 per hour for my time spent working or testifying in this case, plus expenses.

6. I have neither testified nor been deposed as an expert witness in the past four years.

C. Documents, Data and Other Information Considered, Reviewed and/or Referenced

1. MCC's quarterly reports from the 4th Quarter of 1999 to the 4th Quarter of 2004.

2. Biodiversity Conservation Alliance and Sierra Club Complaint.
3. Answer of Mountain Cement Company to the Complaint.
4. Chapter 5 - National Emission Standards Wyoming Air Quality Standards and Regulations
5. Review of the plant process and ESP operations during a June 7 & 8, 2005 plant visit.
6. Electrical Maintenance History Records 12/94 – 2/02
7. Mechanical Maintenance History Records 12/94 – 2/02
8. Electric Shop Logs 9/16/02
9. Electric Shop Logs 2/11/04
10. Daily Instrument log 2001
11. Kiln #2 Opacity- Explanation for Exceedance 2002
12. Kiln #2 Opacity- Explanation for Exceedance 2003
13. The Micropol ESP Manual
14. TRK Engineering/Precipitator Seminar's "Operations and Maintenance Seminar Reference Material on Electrostatic Precipitation", Jacob Katz & Thomas Keeler, rev. 2004.
15. Appendix A of the "Operation and Maintenance Manual for Electrostatic Precipitators", EPA/625/1-85/017, September 1985
16. "Electrostatic Precipitator Maintenance Guide" EPRI (E21376), February 2003.
17. "The Art of Electrostatic Precipitation" Jacob Katz, PE, 1979.
18. TRK Engineering Outage Reports Reference Number MC010622
19. TRK Engineering Outage Reports Reference Number MC020413
20. TRK Engineering Outage Reports Reference Number MC030410
21. TRK Engineering Outage Reports Reference Number MC040401

22. Exhibit J to Plaintiffs' Motion for Partial Summary Judgment to Establish Defendant's Liability for Opacity Violations.

23. Exhibit P to Plaintiffs' Motion for Partial Summary Judgment to Establish Defendant's Liability for Opacity Violations.

D. Description of Assignment

I have been asked to serve as an expert for MCC in this case. I was asked to review the relevant documents to the case and form an opinion of whether the causes of the excess opacity documented by MCC for Kiln #2 are Startups, Shutdowns and Malfunctions (SSMs) as defined by Wyoming and Federal regulations. I have also been asked to comment on the operations and maintenance of the Kiln #2 Electrostatic Precipitator (ESP) located at the MCC Laramie WY, Plant.

E. Assumptions

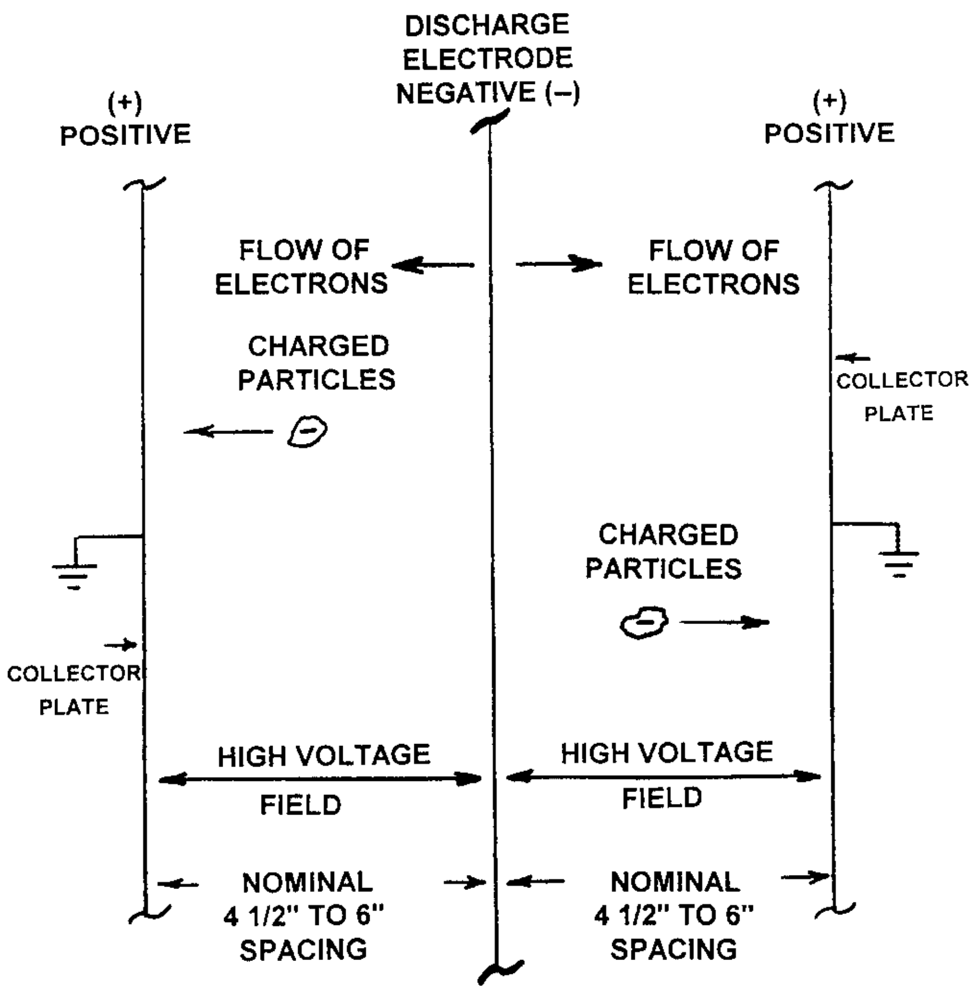
I have assumed that the data presented in the quarterly reports and the data reviewed are accurate.

F. Summary Report

Mountain Cement company has two kiln systems in operation at their Laramie WY Facility. Kiln #1 is a Long Dry Kiln that utilizes a Baghouse and Kiln #2 is a Preheater Kiln system that uses Preheater Cyclones integrated with a Raw Mill and Cooling Tower. The two Kiln systems are very different. Kiln #1 is a much simpler design that operates at a constant high temperature. The Kiln #1 system therefore should have less malfunction of the equipment and less start-up and shutdown period of the related equipment. Because of the simplicity of Kiln #1 it is my opinion that a Baghouse or an Electrostatic Precipitator that was designed properly would tend to have less excess opacity periods than similar equipment on the Kiln #2 system. Kiln #2 system is more complex because it has been designed to provide the feed material for both Kiln #1 and Kiln #2. This function alone makes Kiln #2 more complex and more likely to have startups, shutdowns and malfunction of the system's equipment. Because of theses difference and the complexity of the Kiln #2 system, the use of a baghouse on the Kiln #2 system would not have the same beneficial results as when the ESP was replaced with a baghouse on Kiln # 1 system.

The Kiln #2 System uses an electrostatic precipitator (ESP) to the collect the dust in the exhaust gas steam from the Preheater Kiln and the Roller Mill. For over 80 years electrostatic precipitators (ESPs) have been used in the cement application, and many other industrial applications, to collect particulate material from flue gas streams at very

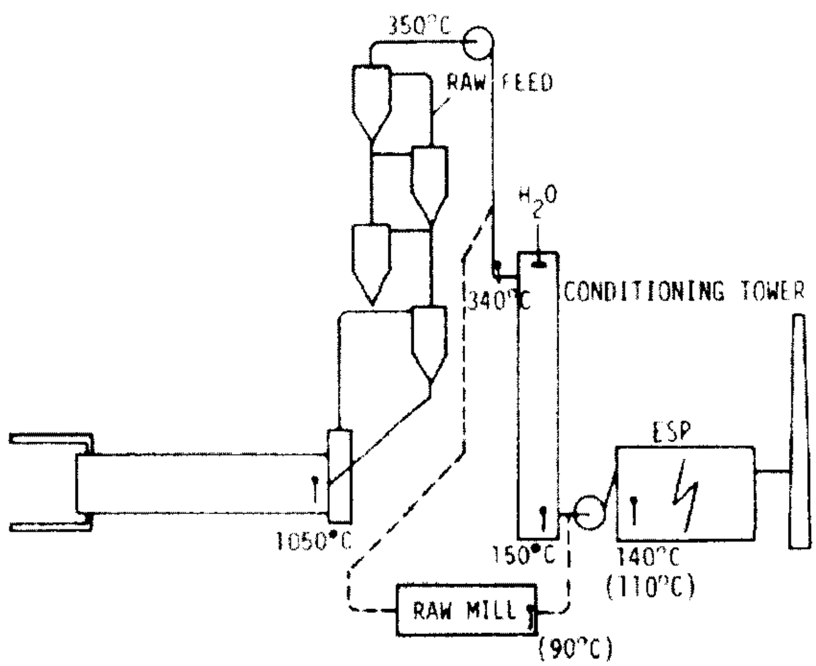
high efficiencies. The basic theory of electrostatic precipitation is based on the simple principle that opposites attract. The ESP is constructed of precisely aligned, light gauge collecting plates arranged parallel to the gas flow. Placed midway between the collecting plates are discharge electrodes that are energized with a high negative pulsating voltage. As particles suspended in the gas stream pass through the electrostatic field created by the discharge electrodes, they are charged and attracted to the collecting plates. The collected dust is then shaken loose by rappers, falling into hoppers located beneath the ESP for transport and reintroduction into the kiln system. Below is an example of the electrical field acting on the particles in the gas stream. The higher the voltage on the discharge electrode, the faster the particles will be pushed to the collecting plates and the higher the collection efficiency.



ELEVATION
CUT VIEW OF GAS PASSAGE

The electrostatic precipitator serving the Kiln #2 system is a dual chamber unit that was originally designed and manufactured by Micropol. A cyclone mechanical collector is located downstream of the roller mill prior to the precipitator. The precipitator has three mechanical fields (12'-9" X 30') and four electrical fields in the direction of gas flow. The electrostatic precipitator has 40 gas passages (20 per chamber) spaced at 9". The 1st field is divided into 2 electrical sections in the direction of gas flow, each energized by a dual bushing transformer rectifier rated at 45,000 Volts & 1000 Milliamperes. The 2nd and 3rd fields each have a single electrical field (formed by jumpering together the individual bus sections) energized by dual bushing transformers rated at 45,000 Volts & 2000 Milliamperes. The transformer rectifiers are controlled by SQ-300 automatic voltage controls supplied by Preciptech/BHA. Rapping of the collecting plates is via mechanical tumbling hammers; the discharge electrodes are rapped with electric rappers supplied by AVC Specialists. During the 2003 outage a new central computer was installed supplied by BHA. This computer was used to better control the rapper operations to help reduce opacity levels. The computer also provides data logging of the rappers, power levels of the transformer rectifiers and other process data to better trend the equipment parameters and pinpoint malfunctions faster to reduce opacity exceedances.

Below is a simple diagram of a Kiln system similar to the installation at the MCC Kiln #2.

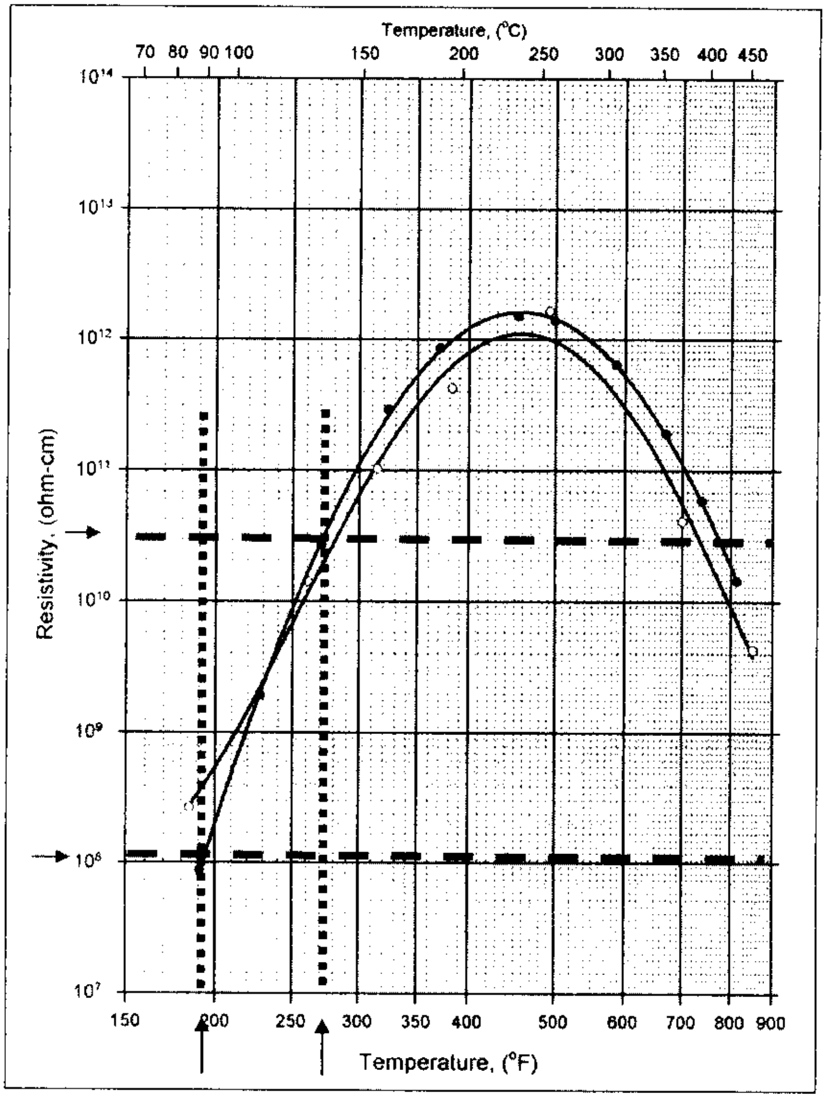


At Mountain Cement the major portion of the hot Kiln gasses pass through the raw mill, where the gas obtains moisture from the raw material in the mill, and is cooled by contact with the raw material. The cooled, moistened gas exiting the raw mill is then reunited and mixed with the remaining part of the kiln gas, which has been cooled in the conditioning tower. This gas mixture then enters the ESP, normally with ideal operating temperature and moisture content for good ESP operations. When the raw mill is stopped, all the kiln gases are diverted through the conditioning tower, where they are cooled with water sprays before entering the ESP. Again, the purpose is to condition the gas to temperatures and moisture contents that are conducive to good precipitation. This allows the ESP performance to be good with the mill in operation or with the mill stopped.

Unstable ESP operations and reduced efficiencies can occur when the raw mill and kiln are in process transition (startup or shutdown) which creates a fluctuation in the flue gas temperature and/or the flue gas moisture content. For instance, when the mill is shut down, the mill gate is swung to divert 100% of the flow to the cooling tower, which can allow the temperature in the ESP to increase rapidly without sufficient conditioning moisture. Similarly, when the Mill is started up, the flue gas is diverted to the cold idle mill, which must be heated up before the proper level of moisture can be achieved by evaporation of the material in the mill.

These changes in moisture content and temperature affect the ESP operation by affecting the resistivity of the particulate dust that is collected on the plates in the ESP. Resistivity is defined as the resistance of this dust layer to the flow of electric current , which develops a voltage drop across the layer. Think of this phenomenon as a form of Ohms Law (volts = current X resistance), and the voltage that occurs will be of different values across the whole area of the ESP depending on the localized conditions of the dust layer. It is this resistance of the layer, or resistivity, that can either help or hinder the collection efficiency of the ESP. For example, the cohesion of the dust particles in the layer will improve with rising resistivity levels. Conversely, excessive dust losses from the layer will occur as resistivity drops below a certain level. But the main impact of resistivity on the performance of the ESP will be seen in its effect on the electrical characteristics, both good and bad.

Below is a typical resistivity curve for a Preheater Kiln system. (This curve will vary depending on dust chemistry and moisture content).



Collection problems for cement dust from a preheater Kiln generally occur when dust resistivity is below 10^8 ohm-cm. At this level the resistivity is too low and the material can not be held on the collecting plates, resulting in increased opacity because of elevated reentrainment losses. Conversely, when the dust resistivity is above 2 X 10^{10} ohm-cm the ESP typically begins to spark and the voltage is reduced. At this high level, opacity will increase because of the reduced collection efficiency caused by the reduced operating voltages. For most plants, there is an optimum good temperature zone where dust resistivity is favorable for good ESP performance. In the example above this optimum operating zone would be 190 degrees F to 270 degrees F. This optimum zone can change with changes in the moisture content of the flue gas and changes in the chemical compositions of the dust.

Although adverse dust resistivity, influenced by gas temperature, moisture content, and dust chemistry, is the most common condition afflicting ESP performance, there are a multitude of other conditions that can affect ESP performance. ESP performance can be adversely affected by loss of TR voltage, reduced KV levels caused by an increase in sparking from excessive buildups on the internal components, damage to the internal components, or hopper pluggages. Localized air infiltration and/or sudden or fluctuating changes in gas flow rates can also increase opacity by increasing reentrainment losses. Startups, Shutdowns and/or Malfunctions (SSM) of process equipment in the Kiln system can cause any of the adverse conditions that will reduce ESP performance and result in higher stack opacity.

The majority of the excess exceedances documented over the review period were attributed to Startups, Shutdowns and/or Malfunctions (SSM) of process equipment. I reviewed the National Emissions Standards in the Wyoming Air Quality Standards and Regulations, and am familiar with the definitions of "startup", "shutdown", and "malfunction" in WASRQ Chapter 5, Sections 2 and 3. Malfunctions are defined by the State of Wyoming and the Federal Government as any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. All of the malfunctions listed on the MCC quarterly reports would be considered infrequent and none of the unknown malfunctions contributed to more than 0.08% of the total excess opacities (see attachment #1). Additionally, there was no repetitive contribution of any of the malfunction causes from quarter to quarter.

The MCC quarterly reports from December 23, 1999 through the 4th Quarter of 2004 demonstrate that 99.92 % of the excess opacity experienced by MCC during that period can be related to a startup, shutdown, malfunction or other excused causes. Prior to the 3rd Quarter of 2002 MCC identified the causes of excess opacity based on the standard form found in the Chapter 5 - National Emission Standards Wyoming Air Quality Standards and Regulations (Attachment #2). These regulations require documentation to identify the excess opacity only as a Startup/Shutdown, Control Equipment Problems, Process Problems, Other Known Problems, and Unknown Causes. Starting in the 3rd Quarter of 2002 MCC began to categorize causes of excess opacity in greater detail in an effort to better identify the causes of excess emission incidents to improve operations and reduce the number of occurrences of excess opacity. Causes of excess opacity after the 3rd Quarter of 2002 were identified as attributable to one or more of the following:

Item #	Cause of Excess Opacity	Description *
1	Kiln start up	Start putting feed into kiln. Includes cold startup and hot startup. (fuel feed but no kiln feed)
2	Kiln shut down	Stop rotation of kiln; stop kiln fuel feed
3	Raw mill start up	Start up of raw mill
4	Raw mill shut down	Shut down of raw mill

5	Opacity increased while starting up auxiliary equipment	Includes start up of ID fan, precipitator fans, elevators and conveyors, other equipment
6	Erratic feed rate	Bridging or plugging of kiln feed system
7	Erratic fuel rate	Bridging or plugging of fuel feed system
8	Plugged system	Preheat tower plug or kiln ring formation
9	Broken dust collector bag(s)	Broken baghouse bags
10	Electrical malfunction in precipitator	Trip of AVC controls or rapper controls in ESP
11	Mechanical malfunction in precipitator	Breakage of internal components (plates, hammer, wire) or hopper plugs
12	Lost auxiliary equipment	Shutdown or malfunction of ID fan, precipitator fan, elevator or conveyor, or other equipment
13	Lost spray tower exit temperature control	Problem with spray system: water sprays, pumps, solenoids, etc.
14	Working in/on process system	Shutdown for repairs caused by a malfunction
15	Working in/on pollution control equipment	Full or partial shutdown for repairs caused by a malfunction
16	Fan output began ramping up or down	Plug in system or oscillation caused by electrical problem or system pluggage (item #8).
17	Process/ID fan malfunctioned or shut down unexpectedly	Could be any process fan that has a malfunctioned
18	Malfunction of sprays at spray tower	Malfunction of spray nozzles/lances
19	Process gas temperature was out of optimum range	Caused by Item # 18 or # 13
20	Electrical surge / outage / power bump	External power source caused tripping of plant equipment
21	Unknown cause	Excess opacity event that self-corrects before the cause can be identified.
22	Dirty monitor lens	Monitor failure
23	Monitor failed or began sending erroneous data	Monitor failure
24	Other cause	Excess opacity event that self-corrects before the cause can be identified.
25	WDEQ/ADQ – approved precipitator inlet temperature test	Received WDEQ waiver of opacity limits for MACT test

*Note: The above descriptions are not on the quarterly reports. These descriptions were provided by plant personnel during the site visit on June 7 & 8, 2005. During that visit, I inspected the ESP and visited with MCC's plant manager, Mike Meysing, and environmental manager, Bill Sansing, to obtain a

better understanding of MCC's description of the causes listed in its quarterly excess opacity reports. I also reviewed the 2002 and 2003 Kiln #2 explanation of opacity exceedance forms that MCC's operators in the control room fill out when there is excess opacity from Kiln 2. These forms identify the cause and corrective action taken of each period of excess opacity and supported the explanations provide by Mike Meysing and Bill Sansing.

The above classified causes (other than unknown) used by MCC on their newer quarterly reports in my opinion are all considered a Startup, Shutdown and/ or Malfunction (SSM) of the kiln system equipment. The unknown causes (#21 & #24) listed above were minimal, averaging .08% of the operating time over the 5-year review period. The unknown causes typically rapidly occurred and self corrected. Their short duration did not provide enough time to identify the cause of the events that caused an increased opacity levels.

The above causes can be categorized into startup, shutdown or malfunctions (SSM) as follows:

<u>Startup/Shutdown</u>

- Kiln start up
- Raw mill start up
- Opacity increased while starting up auxiliary equipment
- Kiln shut down
- Raw mill shut down
- Lost auxiliary equipment
- Working in/on process system
- Working in/on Pollution Control Equipment

<u>Malfunction</u>

- Erratic feed rate
- Erratic fuel rate
- Plugged system
- Broken dust collector bag(s)
- Electrical malfunction in precipitator
- Mechanical malfunction in precipitator
- Lost spray tower exit temperature control
- Fan output began ramping up or down
- Process/ID Fan malfunctioned or shut down unexpectedly
- Malfunction of sprays at spray tower
- Process gas temperature was out of optimum range
- Electrical surge / outage / power bump

- Control Equipment Problems
- Dirty monitor lens
- Monitor failed or began sending erroneous data

Unknown or Excused Causes

- Unknown cause
- Other cause
- WDEQ/ADQ - Approved Precipitator Inlet Temperature Test

The use of the categorical breakdown of excess opacity causes starting in the 3rd Quarter of 2002 allowed the plant to take a proactive step towards reducing excess opacities. The excess opacity periods for Kiln #2 have decreased steadily from 2002 to 2004; in 2002 the annual total was 4.03% of the operating hours, in 2003 the annual total was 2.60% of the operating hours, and in 2004 the annual total was 1.75% of the operating hours. (See attachment #1)

The Wyoming & Federal Regulations state that failures that are caused in part by poor maintenance or careless operation are not malfunctions. (see attachment #2) In the review of the maintenance logs and the annual outage reports the plant has been performing all required routine preventative maintenance (PM) on the Kiln #2 system equipment and has been upgrading systems to improve reliability of the equipment. The maintenance logs show that MCC is performing daily, weekly, and monthly maintenance as required for the ESP. The plant has performed the required annual maintenance on the ESP and has made improvements to the ESP during each annual outage. These improvements have included flow modifications to improve the temperature distribution in the ESP, the installation of a new ESP data management system, and a new rapper panel. All of these improvements represent proactive measures to reduce stack opacity and what would be considered more than routine maintenance to the ESP.

The Kiln #2 ESP is sized sufficiently to maintain the stack opacity within compliance as defined by both the Wyoming and Federal regulations. The opacity trending and quarterly reports show that the ESP has been able to maintain opacity far below the 6 minute 20% opacity limit under normal operating conditions. The majority of the time during start-ups, shutdowns and malfunctions the opacity is below the 6 minute 20% opacity limit. Only under extreme conditions during startups, shutdowns and/or malfunctions has the opacity exceeded the 6 minute 20% opacity limits. It is important to recognize that start-ups, shutdowns and malfunctions of the kiln, rollermill and other equipment can typically last from 15 minutes to over 24 hours, and in that total time period of the start-up, shutdown and malfunction condition the opacity may never exceed or may partially exceed the 6 minute 20% opacity limit. In an effort to reduce the overall opacity levels under normal operating conditions, and further during start-up, shutdown and malfunction periods, the plant has been upgrading the ESP. This is in

addition to the use of the more detailed categorized quarterly reports used to help them identify problems with the process and equipment more quickly. These upgrades and better reporting have resulted in a steady decrease of opacity exceedances and in 2004 the total time the opacity was in excess of the 6 minute 20% limit was for 1.75% of the total operating hours.

Based on my experience, using an ESP would be the better choice considering the conditions at the plant and the complexity of the Kiln #2 system. Because of the location of the plant (elevation above sea level) more than normal air flow for this type of Kiln #2 system is needed to provide enough oxygen for combustion in the kiln. This requires more process gas than usual to be bypassed around the roller mill, which creates conditions during start-ups, shutdowns and malfunctions that make the ESP the best choice as the pollution control equipment. It is safe to say that replacing the existing ESP with any type of new pollution control equipment should improve performance over the existing ESP, however, there is no clear cut advantage to using a baghouse in this application and especially at this plant location. In fact there are ESPs installed on this type of cement kiln system (preheater kiln system) that have outperformed baghouses. Considering the large swings in moisture and temperature that are required to operate the plant at the high elevation, a baghouse could actually operate poorer than an ESP as a result of damage to the bags from excessive heat or blinding of the bags from excess moisture levels that occur during normal shutdowns, startups and malfunctions.

If regulations change in the future and the existing ESP needs to be replaced with a new ESP or a new baghouse, it has been my experience that the most cost effective way to replace the ESP is to build the new equipment adjacent to the existing equipment. There is sufficient land to construct a new ESP or a new baghouse at the Wyoming facility. This method of construction allows the equipment to be built at minimum cost and tied in to the process over a 2 to 3 day outage or during an annual outage.

Based on the information reviewed, my experience and expertise with this ESP, and ESPs at other similar plants, in my opinion MCC has been operating the ESP and Kiln System correctly and performing the proper maintenance to the ESP and Kiln System. The identified causes of the excess opacity that occurred are normal to Kiln operation and startups, shutdowns, and/or malfunctions of the Kiln #2 system equipment.

I prepared as Attachment #1 a table of excess opacity using data from the quarterly reports that MCC submitted to the Wyoming Department of Environmental Quality covering periods from December 23, 1999 through the fourth quarter of 2004 (the review period). Of the 1,300.3 hours of excess opacity during the review period, it is my opinion that 97.5 percent of the excess opacity periods, or 1,268.3 hours (or 12,683 six-minute periods) are identified as being caused by startup, shutdown, malfunction or other excused causes. The 2.5 percent of excess opacity periods for Kiln #2 that are identified as unknown causes represent only 32.0 hours (or 320-six-minute periods) of excess opacity from December 23, 1999 through fourth quarter 2004.

I have reviewed the chart of excess opacity at MCC that is identified as Exhibit J to Plaintiffs' Motion for Partial Summary Judgment to Establish Defendant's Liability for Opacity Violations. Exhibit J reports there were 15, 480 six-minute periods of excess opacity from Kiln 2. That total is inaccurate because Exhibit J has calculation errors in three quarters, the 4th quarter of 1999, 1st quarter of 2000, and the 4th quarter of 2000. Therefore, the correct number of six-minute periods of excess opacity from December 23, 1999, 5 years before the lawsuit was filed, through December 31, 2004 is 13,003, not 15,480.

I have reviewed the tables labeled as Kiln #2 Particulate Matter Violations identified as Exhibit P to Plaintiffs' Motion for Partial Summary Judgment to Establish Defendant's Liability for Opacity Violations. Exhibit P reports there were 800.6 hourly periods where Mountain Cement excess opacity was greater than 20%. That total is inaccurate because Exhibit P includes all excess opacity in the 4th quarter of 1999, not just those from December 23-31 of 1999, 5 years before the lawsuit was filed, and all excess opacity in the 1st quarter of 2005 after Plaintiffs filed their suit. Therefore, the correct number of hourly periods of excess opacity greater than 20% from December 23, 1999 through December 31, 2004 is 579.2 hours, not 800.6 (see attachment #4). Of the 579.2 hourly periods where opacity was greater than 20% only 4.9 hours were identified on the quarterly reports as unknown causes. The other 574.3 hours (99.2% of the total hourly periods) are identified as being caused by events defined as startup, shutdown, malfunction or other excused causes.

I reserve the right to supplement my opinions regarding this matter, as additional information becomes available.

Executed this 15th day of August, 2005, at Carlisle, Massachusetts

Thomas R. Keeler

Attachments:

1. Summary of Quarterly Excess Opacity Report
2. Pages from Chapter 5 - National Emission Standards Wyoming Air Quality Standards and Regulations
3. Appendix A, EPA Manual - ESP Applications in the Cement Industry
4. Summary of Average Hourly Opacity > 20%
5. Resume for Thomas Keeler

Attachment #1

Summary of Quarterly Excess Opacity Reports

SUMMARY OF KILN #2 QUARTERLY EXCESS OPACITY REPORTS - MOUNTAIN CEMENT, LARAMIE, WY

	Kiln #2 Summary of the Quarterly Excess Opacity Reports																						
Item #	Cause Code	12/23-31/9	Q1 - 2000	Q2 - 2000	Q3 - 2000	Q4 - 2000	Q1 - 2001	Q2 - 2001	Q3 - 2001	Q4 - 2001	Q1-2002	Q2 - 2002	Q3 - 2002	Q4 - 2002	Q1 - 2003	Q2 - 2003	Q3 - 2003	Q4 - 2003	Q1 - 2004	Q2 - 2004	Q3 - 2004	Q4 - 2004	Total
	Total Operating Hours	216.00	1720.70	2054.50	1883.00	2127.60	2017.80	1851.20	2092.08	2049.85	1970.68	1857.32	2116.99	2105.40	2103.35	1844.30	2138.65	2025.75	2023.00	2012.70	2169.70	2012.70	40393.27
	CMS Downtime Hours	54.45	3.60	7.70	0.80	0.00	1.30	120.60	27.40	51.70	78.80	7.70	8.10	8.30	35.60	7.70	18.10	4.00	3.10	14.40	11.40	6.40	471.15
	% of CMS Downtime	25.21	0.21	0.37	0.04	0.00	0.06	6.51	1.31	2.52	4.00	0.41	0.38	0.39	1.69	0.42	0.85	0.20	0.15	0.72	0.53	0.32	46.30
	Total Reportable Hours	161.55	1717.10	2046.80	1882.20	2127.60	2016.50	1730.60	2064.68	1998.15	1891.88	1849.62	2108.89	2097.10	2067.75	1836.60	2120.55	2021.75	2019.90	1998.30	2158.30	2006.30	39922.12
1	Kiln start up												5.10	2.10	1.20	2.30	0.50	15.80	1.70	4.20	8.40	1.40	42.70
3	Raw mill start up												7.40	14.50	8.40	4.30	4.80	4.30	0.60	4.10	1.60	5.90	55.90
5	Opacity increased while starting up auxiliary equipment												0.00	3.60	0.00	0.30	3.60	0.00	0.40	0.00	0.40	1.40	9.70
2	Kiln shut down												1.50	0.50	1.80	1.30	0.30	0.40	1.00	0.80	0.90	3.80	12.30
4	Raw mill shut down												0.00	0.50	13.00	3.00	1.10	10.30	1.10	10.40	9.80	17.40	66.60
12	Lost auxiliary equipment												0.00	2.50	0.90	4.90	0.60	0.70	5.50	0.10	0.00	6.90	22.10
14	Working in/on process system												15.50	12.00	21.40	1.20	4.10	2.70	1.40	4.50	1.00	0.10	63.90
15	Working in/on Pollution Control Equipment												0.00	1.50	1.70	0.00	7.10	11.30	0.00	0.00	6.00	0.90	28.50
A	Startup/Shutdown	0.00	0.40	0.00	7.40	7.50	1.90	12.10	24.00	27.20	16.90	4.00											101.40
Total	Startup/Shutdown	0.00	0.40	0.00	7.40	7.50	1.90	12.10	24.00	27.20	16.90	4.00	29.50	37.20	48.40	17.30	22.10	45.50	11.70	24.10	28.10	37.80	403.10
% Total	Startup/Shutdown	0.00	0.02	0.00	0.39	0.35	0.09	0.70	1.16	1.36	0.89	0.22	1.40	1.77	2.34	0.94	1.04	2.25	0.58	1.21	1.30	1.88	1.01
6	Erratic feed rate												3.70	0.00	1.70	0.50	0.20	0.60	1.50	0.10	0.40	0.00	8.70
7	Erratic fuel rate												0.30	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.20	0.00	0.60
8	Plugged system												0.50	0.00	0.00	1.30	5.00	7.30	17.00	0.10	0.40	1.20	32.80
9	Broken dust collector bag(s)												0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70
10	Electrical malfunction in precipitator												6.10	3.70	0.10	0.20	0.70	2.40	0.00	0.00	0.00	0.00	13.20
11	Mechanical malfunction in precipitator												0.00	1.50	0.30	0.10	0.00	0.00	0.00	0.00	0.00	0.00	1.90
13	Lost spray tower exit temperature control												0.00	11.30	10.50	3.80	0.00	0.10	1.90	0.00	0.30	0.20	28.10
16	Fan output began ramping up or down												0.00	0.00	0.00	0.00	0.20		0.10	0.00	0.00	0.10	0.40
17	Process/ID Fan malfunctioned or shut down unexpectedly												0.00	0.00	0.20	0.00	0.00	0.00	1.50	0.30	0.00	0.10	2.10
18	Malfunction of sprays at spray tower												0.00	0.80	0.00	0.00	0.10	0.00	0.00	0.00	4.90	0.60	6.40
19	Process gas temperature was out of optimum range												0.00	1.60	6.00	2.10	0.00	0.70	0.00	0.30	1.20	0.60	12.50
20	Electrical surge / outage / power bump												0.00	0.00	3.60	2.20	1.00	13.30	0.00	0.00	6.00	0.00	26.10
22	Dirty monitor lens												0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.50
23	Monitor failed or began sending erroneous data												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10
B	Control Equipment Problems	0.00	11.00	4.80	0.00	6.30	6.80	65.40	35.90	76.70	139.40	60.00											406.30
C	Process Problems	1.00	5.90	23.70	8.20	24.70	35.30	70.10	83.10	38.70	1.60	0.10											292.40
D	Other Known Problems	0.00	0.30	3.50	2.90	7.20	9.50	0.50	0.00	1.60	0.00	0.00											25.50
Total	Malfunction	1.00	17.20	32.00	11.10	38.20	51.60	136.00	119.00	117.00	141.00	60.10	10.60	18.90	23.30	10.20	7.20	24.50	22.00	0.80	13.40	3.20	858.30
% Total	Malfunction	0.62	1.00	1.56	0.59	1.80	2.56	7.86	5.76	5.86	7.45	3.25	0.50	0.90	1.13	0.56	0.34	1.21	1.09	0.04	0.62	0.16	2.15
21	Unknown cause												1.00	0.00	1.30	0.50	0.10	1.20	0.10	1.50	0.50	0.00	6.20
24	Other cause												0.50	0.00	0.40	0.70	0.00	0.00	0.00	0.00	0.00	0.00	1.60
Total / E	Unknown Causes	1.70	1.60	1.30	1.50	4.70	4.60	6.70	1.40	0.40	0.00	0.30	1.50	0.00	1.70	1.20	0.10	1.20	0.10	1.50	0.50	0.00	32.00
% Total	Unknown Causes	1.05	0.09	0.06	0.08	0.22	0.23	0.39	0.07	0.02	0.00	0.02	0.07	0.00	0.08	0.07	0.00	0.06	0.00	0.08	0.02	0.00	0.08
25	WDEQ/ADQ - Approved Precipitator Inlet Temperature Test												0.00	0.00	0.00	0.00	6.90	0.00	0.00	0.00	0.00	0.00	6.90
Total	Other Excused Causes												0.00	0.00	0.00	0.00	6.90	0.00	0.00	0.00	0.00	0.00	6.90
% Total	Other Excused Causes												0	0	0	0	0.33	0	0	0	0	0	0.33
	Total Duration of Excess Opacity (hours)	2.70	19.20	33.30	20.00	50.40	58.10	154.80	144.40	144.60	157.90	64.40	41.60	56.10	73.40	28.70	36.30	71.20	33.80	26.40	42.00	41.00	1300.30
	% of Excess Opacity per Reportable Hours	1.67	1.12	1.63	1.06	2.37	2.88	8.94	6.99	7.24	8.35	3.48	1.97	2.68	3.55	1.56	1.71	3.52	1.67	1.32	1.95	2.04	3.26
Total	Total Reportable Hours	161.55				7773.70				7809.93				7947.49				8046.65				8182.80	39922.12
Total	Total Excess Opacity Hours	2.70				122.90				501.90				320.00				209.60				143.20	1300.30
%Total	% Excess Opacity per Reportable Hours	1.67				1.58				6.43				4.03				2.60				1.75	3.26

Attachment #2

Pages From

Chapter 5 - National Emissions Standards

Wyoming Air Quality Standards and Regulations

TABLE OF CONTENTS

CHAPTER 5 - NATIONAL EMISSION STANDARDS

WYOMING AIR QUALITY STANDARDS AND REGULATIONS

Section 1. Introduction to national emission standards.

(a) This Chapter incorporates emission control regulations developed by the Environmental Protection Agency for specific source categories. The State of Wyoming, Air Quality Division adopts these Federal Regulations in order to maintain administrative authority with regards to the standards. Section 2 contains New Source Performance Standards (NSPS) which regulate criteria pollutant emissions from specific categories of new sources. Section 3 contains National Emission Standards for Hazardous Air Pollutants (NESHAP) which regulate hazardous air pollutant emissions from specific categories of new and existing sources.

Section 2. New source performance standards.

(a) General: The U.S. Environmental Protection Agency regulations on Standards of Performance for New Stationary Sources, designated in Chapter 5, Section 2(b) and as amended by the word or phrase "substitutions" given in Chapter 5, Section 2(c), are incorporated into these regulations. The specific documents containing the complete text of the regulations are found in 40 CFR part 60, as revised and published as of July 1, 2001. The specific documents containing the complete text of the reference test and monitoring methods, performance specifications for continuous monitors, procedures for determination of emission rate change, specifications for emission inventory information requirements, quality assurance requirements for CEM's, and labeling guidance to manufacturers of new residential wood heaters are found in 40 CFR part 60, Appendices A, B, C, D, F, and I respectively, as revised and published as of July 1, 2001.

(b) Designated standards of performance: The following Standards of Performance, as revised and published as of July 1, 2001, not including any later amendments, are adopted by reference. Copies of Standards of Performance can be obtained from the Department of Environmental Quality, Division of Air Quality, 122 W. 25th Street, Cheyenne, Wyoming 82002.

40 CFR part 60, Subpart D -	Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction is Commenced After August 17, 1971
40 CFR part 60, Subpart Da -	Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978
40 CFR part 60, Subpart Db -	Standards of Performance for Industrial-Commercial-Institutional Steam Generating

"Issuance" of an operating permit will occur, in accordance with Chapter 6, Section 3.

"Malfunction" means any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

"Monitoring device" means the total equipment, required under the monitoring of operations sections, used to measure and record (if applicable) process parameters.

"Nitrogen oxides" means all oxides of nitrogen except nitrous oxide, as measured by test methods set forth in this part.

"One-hour period" means any 60-minute period commencing on the hour.

"Opacity" means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background.

"Operating permit" or ***"Part 70 permit"*** means any permit or group of permits covering a source under Chapter 6, Section 3 that is issued, renewed, amended or revised pursuant to Chapter 6, Section 3.

"Owner or operator" means any person who owns, leases, operates, controls, or supervises an affected facility or a stationary source of which an affected facility is a part.

"Particulate matter" means any finely divided solid or liquid material, other than uncombined water, as measured by the reference methods specified under each subpart, or an equivalent or alternative method.

"Permit program" means the comprehensive State operating permit system established pursuant to Title V of the Act (42 U.S.C. 7661) and regulations in Chapter 6, Section 3.

"Proportional sampling" means sampling at a rate that produces a constant ratio of sampling rate to stack gas flow rate.

"Reactivation of a very clean coal-fired electric utility steam generating unit" means any physical change or change in the method of operation associated with the commencement of commercial operations by a coal-fired utility unit after a period of discontinued operation where the unit:

(A) has not been in operation for the two-year period prior to the enactment of the Clean Air Act amendments of 1990, and the emissions from such unit continue to be carried in the permitting authority's emissions inventory at the time of enactment;

(B) was equipped prior to shut-down with a continuous system of emissions control that achieves a removal efficiency for sulfur dioxide of no less than 85 percent and a removal efficiency for particulates of no less than 98 percent;

(C) is equipped with low-NO_x burners prior to the time of commencement of operations following reactivation; and

(D) is otherwise in compliance with the requirements of the Clean Air Act.

"Reference method" means any method of sampling and analyzing for an air pollutant as specified in the applicable subpart.

"Repowering" means replacement of an existing coal-fired boiler with one of the following clean coal technologies: atmospheric or pressurized fluidized bed combustion, integrated gasification combined cycle, magnetohydrodynamics, direct and indirect coal-fired turbines, integrated gasification fuel cells, or as determined by the Administrator of EPA, in consultation with the Secretary of Energy, a derivative of one or more of these technologies, and any other technology capable of controlling multiple combustion emissions simultaneously with improved boiler or generation efficiency and with significantly greater waste reduction relative to the performance of technology in widespread commercial use as of November 15, 1990. Repowering shall also include any oil and/or gas-fired unit which has been awarded clean coal technology demonstration funding as of January 1, 1991, by the Department of Energy.

"Run" means the net period of time during which an emission sample is collected. Unless otherwise specified, a run may be either intermittent or continuous within the limits of good engineering practice.

"Shutdown" means the cessation of operation of an affected facility for any purpose.

"Six-minute period" means any one of the 10 equal parts of a one-hour period.

"Standard" means a standard of performance proposed or promulgated under this part.

"Standard conditions" means a temperature of 293°K (68°F) and a

pressure of 101.3 Kilopascals of Hg (29.92 in. of Hg).

"Start-up" means the setting in operation of an affected facility for any purpose.

"State" means the Wyoming Air Quality Division which has been delegated authority to implement:

(A) the provisions of this Section; and/or

(B) the permit program established under 40 CFR part 70.

"Stationary source" means any building, structure, facility, or installation which emits or may emit any air pollutant.

"Volatile organic compounds" means any organic compound which participates in atmospheric photochemical reactions; or which is measured by a reference method, an equivalent method, an alternative method, or which is determined by procedures specified under any subpart.

(ii) Abbreviations:

A	ampere
A.S.T.M.	American Society for Testing and Materials
Btu	British thermal unit
cal	calorie
CdS	Cadmium sulfide
cfm	cubic feet per minute
CO	carbon monoxide
CO_2	carbon dioxide
°C	degree Celsius (centigrade)
°F	degree Fahrenheit
°K	degree Kelvin
°R	degree Rankine
dscm	dry cubic meter(s) at standard conditions
dscf	dry cubic feet at standard conditions
eq	equivalents
g	gram(s)
gal	gallon(s)
g eq	gram equivalents
gr	grain(s)
HCl	hydrochloric acid
Hg	mercury

way relieve the owner or operator of responsibility for compliance with other applicable sections of these regulations. The permit requirements of Chapter 6, Section 2 are specifically applicable to affected facilities subject to the requirements of this Section.

(g) Notification and Recordkeeping:

(i) Any owner or operator subject to the provisions of this section shall furnish the Administrator written notification as follows:

(A) A notification of the date construction (or reconstruction as defined under Chapter 1, Section 3) of an affected facility is commenced postmarked no later than 30 days after such date. This requirement shall not apply in the case of mass-produced facilities which are purchased in completed form.

(B) A notification of any physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies, unless that change is specifically exempted under an applicable subpart or in Chapter 5, Section 2(k). This notice shall be postmarked 60 days or as soon as practicable before the change is commenced and shall include information describing the precise nature of the change, present and proposed emission control systems, productive capacity of the facility before and after the change, and the expected completion date of the change. The Administrator may request additional relevant information subsequent to this notice.

(C) A notification of the date upon which demonstration of the continuous monitoring system performance commences in accordance with Chapter 5, Section 2(j)(iii). Notification shall be postmarked not less than 30 days prior to such date.

(D) A notification of the anticipated date for conducting the opacity observations required by Chapter 5, Section 2(i)(v) of this part. The notification shall be postmarked not less than 30 days prior to such date.

(E) A notification that continuous opacity monitoring system data results will be used to determine compliance with the applicable opacity standard during a performance test required by Chapter 5, Section 2(h) in lieu of Method 9 observation data as allowed by Chapter 5, Section 2(i)(v)(D). This notification shall be postmarked not less than 30 days prior to the date of the performance test.

(ii) Any owner or operator subject to the provisions of this part shall maintain records of the occurrence and duration of any start-up, shutdown, or malfunction in the operation of an affected facility; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative.

(iii) Each owner or operator required to install a continuous monitoring system

(CMS) or monitoring device shall submit an excess emissions and monitoring systems performance report (excess emissions are defined in applicable subparts) and/or a summary report form (see paragraph E of this section) to the Administrator semiannually, except when: more frequent reporting is specifically required by an applicable subpart; or the CMS data are to be used directly for compliance determination, in which case quarterly reports shall be submitted; or the Administrator, on a case-by-case basis, determines that more frequent reporting is necessary to accurately assess the compliance status of the source. All reports shall be postmarked by the 30th day following the end of each calendar half (or quarter, as appropriate). Written reports of excess emissions shall include the following information:

(A) The magnitude of excess emissions computed in accordance with Chapter 5, Section 2(j)(viii), any conversion factor(s) used, and the date and time of commencement and completion of each time period of excess emissions. The process operating time during the reporting period.

(B) Specific identification of each period of excess emissions that occurs during start-ups, shutdowns, malfunctions of the affected facility. The nature and cause of any malfunction (if known), the corrective action taken or preventative measures adopted.

(C) The date and time identifying each period during which the continuous monitoring system was inoperative except for zero and span checks and the nature of the system repairs or adjustments.

(D) When no excess emissions have occurred or the continuous monitoring system(s) have not been in operative, repaired, or adjusted, such information shall be stated in the report.

(E) The summary report form shall contain the information and be in the format shown in Form B unless otherwise specified by the Administrator. One summary report form shall be submitted for each pollutant monitored at each affected facility.

(I) If the total duration of excess emissions for the reporting period is less than 1 percent of the total operating time for the reporting period and CMS downtime for the reporting period is less than 5 percent of the total operating time for the reporting period, only the summary report form shall be submitted and the excess emission report described in paragraph (iii) of this subsection need not be submitted unless requested by the Administrator.

(II) If the total duration of excess emissions for the reporting period is 1 percent or greater of the total operating time for the reporting period or the total CMS downtime for the reporting period is 5 percent or greater of the total operating time for the reporting period, the summary report form and the excess emission report described in paragraph (iii) of this subsection shall both be submitted.

Form B
EXCESS EMISSION SUMMARY REPORT

Emission Data Summary		CMS Performance Summary	
I. Duration of Excess Emissions in Reporting Period Due to: A. Startup/Shutdown	____	I. CMS Downtime in Reporting Period Due to: A. Monitor Equipment Malfunctions	____
B. Control Equipment Problems	____	B. Non-Monitor Equipment Malfunctions	____
C. Process Problems	____	C. Quality Assurance Calibration	____
D. Other Known Causes	____	D. Other Known Causes	____
E. Unknown Causes	____	E. Unknown Causes	____
II. Total Duration of Excess Emission	____	II. Total CMS Downtime	____
III. Total Duration of Excess Emissions x 100 divided by Total Source Operating Time minus Total CMS Downtime	____	III. Total CMS Downtime x 100 divided by Total Source Operating Time	____

Total time of excess emission events due to emergency/abnormal operations__________.

NOTE:

1. Only report excess emissions which occur when the unit/process is operating. Include all excess emissions in the Emission Data Summary including those excess emissions associated with startup/shutdown and those excess emissions associated with Chapter 1, Section 5 (Emergency/Abnormal) operations. **Report times in hours for gaseous monitors and in tenths of an hour for opacity monitors.** Include detailed excess emission information and causes in the Excess Emission Table (Form C).
2. Only report CEM downtime which occurs while the unit/process is operating. **Report time in hours to one decimal point.** Include detailed CEM downtime and causes in the Monitor Outage Table (Form D).
3. Include an explanation of what corrective actions were taken for total excess emissions or monitor downtime for the quarter (Emission Data Summary and CMS Performance Summary, Item III) greater than 5%. **(See Instructions for further details.)**

On a separate page, describe any changes since last quarter in CMS, process or controls. I certify that the information contained in this report is true, accurate, and complete.

Name

____

Signature

____

Title

____

Date

____

(A) Sampling ports adequate for test methods applicable to such facility. This includes:

(I) Constructing the air pollution control system such that volumetric flow rates and pollutant emission rates can be accurately determined by applicable test methods and procedures and;

(II) Providing a stack or duct free of cyclonic flow during performance tests, as demonstrated by applicable test methods and procedures;

(B) Safe sampling platform(s);

(C) Safe access to sampling platform(s);

(D) Utilities for sampling and testing equipment.

(v) Unless otherwise specified in the applicable subpart, each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified in the applicable standard. For the purpose of determining compliance with an applicable standard, the arithmetic means of results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances, beyond the owner or operator's control, compliance may, upon the Administrator's approval, be determined using the arithmetic mean of the results of the two other runs.

(i) Compliance with standards and maintenance requirements:

(i) Compliance with standards in this part, other than opacity standards, shall be determined by performance tests established by Chapter 5, Section 2(h), unless otherwise specified in the applicable standard.

(ii) Compliance with opacity standards in this part shall be determined by conducting observations in accordance with Reference Method 9 in 40 CFR part 60, Appendix A or any alternative method that is approved by the EPA Administrator, or as provided in paragraph (v)(D) of this section. For purposes of determining initial compliance, the minimum total time of observations shall be 3 hours (30 6-minute averages) for the performance test or other set of observations (meaning those fugitive-type emission sources subject only to an opacity standard).

(iii) The opacity standards set forth in this part shall apply at all times except during periods of start-up, shutdown, malfunction, and as otherwise provided in the applicable

standard.

(iv) At all times, including periods of start-up, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

(v) (A) For the purpose of demonstrating initial compliance, opacity observations shall be conducted concurrently with the initial performance test required in Chapter 5, Section 2(h) unless one of the following conditions apply. If no performance test under Chapter 5, Section 2(h) is required, then opacity observations shall be conducted within 60 days after achieving the maximum production rate at which the affected facility will be operated but no later than 180 days after initial start-up of the facility. If visibility or other conditions prevent the opacity observations from being conducted concurrently with the initial performance test required under Chapter 5, Section 2(h), the source owner or operator shall reschedule the opacity observations as soon after the initial performance test as possible, but not later than 30 days thereafter, and shall advise the Administrator of the rescheduled date. In these cases, the 30 day prior notification to the Administrator required in Chapter 5, Section 2(g)(i)(D) shall be waived. The rescheduled opacity observations shall be conducted (to the extent possible) under the same operating conditions that existed during the initial performance test conducted under Chapter 5, Section 2(h). The visible emissions observer shall determine whether visibility or other conditions prevent the opacity observations from being made concurrently with the initial performance test in accordance with procedures contained in reference Method 9 of 40 CFR part 60, Appendix A. Opacity reading of portions of plumes which contain condensed, uncombined water vapor shall not be used for purposes of determining compliance with opacity standards. The owner or operator of an affected facility shall make available, upon request by the Administrator, any records as may be necessary to determine the conditions under which the visual observations were made and shall provide evidence indicating proof of current visible observer emission certification. Except as provided in paragraph (v)(D) of this section, the results of continuous monitoring by transmissometer which indicate that the opacity at the time visual observations were made was not in excess of the standard are probative but not conclusive evidence of the actual opacity of an emission, provided that the source shall meet the burden of proving that the instrument used meets (at the time of the alleged violation) Performance Specification 1 in 40 CFR part 60, Appendix B, has been properly maintained and (at the time of the alleged violation) that the resulting data have not been altered in any way.

(I) The inability of an owner or operator to secure a visible emissions observer shall not be considered a reason for not conducting the opacity observations concurrent with the initial performance test.

(B) The owner or operator of an affected facility to which an opacity standard in this part applies shall conduct opacity observations in accordance with Chapter 5, Section 2(i)(ii), shall record the opacity of emissions, and shall report to the Administrator the opacity results along with the results of the initial performance test required under Chapter 5, Section 2(h).

(C) An owner or operator of an affected facility using a continuous opacity monitor (transmissometer) shall record the monitoring data produced during the initial performance test required by Chapter 5, Section 2(h) and furnish the Administrator a written report of the monitoring results along with Method 9 and Chapter 5, Section 2(h) performance test results.

(D) An owner or operator of an affected facility subject to an opacity standard may submit, for compliance purposes, continuous opacity monitoring system (COMS) data results produced during any performance test required under Chapter 5, Section 2(h) in lieu of Method 9 observation data. If an owner or operator elects to submit COMS data for compliance with the opacity standard, he shall notify the Administrator of that decision in writing, at least 30 days before any performance test required under Chapter 5, Section 2(h) is conducted. Once the owner or operator of an affected facility has notified the Administrator to that effect, the COMS data results will be used to determine opacity compliance during subsequent test required under Chapter 5, Section 2(h) until the owner or operator notifies the Administrator in writing to the contrary. For the purpose of determining compliance with the opacity standard during a performance test required under Chapter 5, Section 2(h) using COMS data the minimum total time of COMS data collection shall be averages of all 6-minute continuous periods within the duration of the mass emission performance test. Results of the COMS opacity determinations shall be submitted along with the results of the performance test required under Chapter 5, Section 2(h). The owner or operator of an affected facility using a COMS for compliance purposes is responsible for demonstrating that the COMS meets the requirements specified in Chapter 5, Section 2(j)(iii) of this part, that the COMS has been properly maintained and operated, and that the resulting data have not been altered in any way. If COMS data results are submitted for compliance with the opacity standard for a period of time during which Method 9 data indicates noncompliance, the Method 9 data will be used to determine opacity compliance.

(E) Upon receipt from an owner or operator of the written reports of the results of the performance tests required by Chapter 5, Section 2(h), the opacity observation results and observer certification required by Chapter 5, Section 2(i)(v)(A) and the COMS results, if applicable, the Administrator will make a finding concerning compliance with opacity and other applicable standards. If COMS data results are used to comply with an opacity standard, only those results are required to be submitted along with the performance test results required by Chapter 5, Section 2(h). If the Administrator finds that an affected facility is in compliance with all applicable standards for which performance tests are conducted in accordance with Chapter 5, Section 2(h) of this part but during the time such

performance tests are being conducted fails to meet any applicable opacity standard, he shall notify the owner or operator and advise him that he may petition the Administrator within 10 days of receipt of notification to make appropriate adjustment to the opacity standard for the affected facility. The notifications received requesting adjustments to the opacity standard of the affected facility will be forwarded to EPA for resolution.

(vi) Special provisions set forth under an applicable subpart in 40 CFR part 60 shall supersede any conflicting provisions in this section.

(vii) For the purpose of submitting compliance certifications or establishing whether or not a person has violated or is in violation of any standard in this section, nothing in this section shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with the applicable requirements if the appropriate performance or compliance test or procedure had been performed.

(j) ***Monitoring requirements:***

(i) For the purposes of this section, all continuous monitoring systems required under applicable subparts shall be subject to the provisions of this section upon promulgation of performance specifications for continuous monitoring systems under 40 CFR part 60, Appendix B and, if the continuous monitoring system is used to demonstrate compliance with emission limits on a continuous basis, 40 CFR part 60, Appendix F, unless otherwise specified in an applicable subpart or by the Administrator. Appendix F is applicable December 4, 1987.

(ii) All continuous monitoring systems and monitoring devices shall be installed and operational prior to conducting performance tests under Chapter 5, Section 2(h). Verification of operational status shall, as a minimum, include completion of manufacturer's written requirements or recommendations for installation, operation, and calibration of the device.

(iii) If the owner or operator of an affected facility elects to submit continuous opacity monitoring system (COMS) data for compliance with the opacity standard as provided under Chapter 5, Section 2(i)(v)(D), he shall conduct a performance evaluation of the COMS as specified in Performance Specification 1, 40 CFR part 60, Appendix B, before the performance test required under Chapter 5, Section 2(h) is conducted. Otherwise, the owner or operator of an affected facility shall conduct a performance evaluation of the COMS or continuous emission monitoring system (CEMS) during any performance test required under Chapter 5, Section 2(h) or within 30 days thereafter in accordance with the applicable performance specification in 40 CFR part 60, Appendix B. The owner or operator of an affected facility shall conduct COMS or CEMS performance evaluations at such other times as may be required by the Administrator.

Attachment #3

Appendix A, EPA Manual
ESP Applications in the Cement Industry